

CLAIMS

1. A method for measuring the kinase activity of a Cdc7-ASK complex, comprising the following steps:

- 5 (a) contacting a substrate protein with the Cdc7-ASK complex under conditions that allow phosphorylation of the substrate protein, wherein the substrate protein is a protein comprising the amino acid sequence of SEQ ID NO: 1, or a protein functionally equivalent to that protein;
- 10 (b) measuring the level of phosphorylation of a serine residue of the substrate protein at the position corresponding to position 17 in the amino acid sequence of SEQ ID NO: 1; and
- (c) measuring the kinase activity of the Cdc7-ASK complex using the level of phosphorylation as an indicator.

15 2. The method according to claim 1, wherein the level of phosphorylation is measured based on the level of binding of an antibody that identifies the level of phosphorylation of the serine residue.

20 3. The method according to claim 1, wherein the Cdc7-ASK complex is derived from a biological sample.

4. A method for measuring the effects of a test compound on the kinase activity of a Cdc7-ASK complex, comprising the following steps:

25 (a) contacting a test compound, a substrate protein and a Cdc7-ASK complex active substance, wherein the substrate protein is a protein comprising the amino acid sequence of SEQ ID NO: 1, or a protein functionally equivalent to that protein, and wherein they are contacted in any of the following orders i) to iii):

30 i) the test compound and substrate protein are contacted, followed by contacting the Cdc7-ASK complex active substance,

ii) the substrate protein and Cdc7-ASK complex active substance are contacted in the presence of the test compound, or

35 iii) the substrate protein and Cdc7-ASK complex active substance are contacted, followed by contacting the test compound;

(b) measuring the level of phosphorylation for a serine residue

of the substrate protein at the position corresponding to position 17 in the amino acid sequence shown in SEQ ID NO: 1; and

5 (c) measuring the effect of the test compound on the kinase activity of the Cdc7-ASK complex active substance using the level of phosphorylation as an indicator.

5. A method of screening for compounds comprising the effect of regulating the kinase activity of a Cdc7-ASK complex, comprising the following steps:

10 (a) measuring the effect of a test compound on the kinase activity of the Cdc7-ASK complex according to the method described in claim 4; and

(b) selecting a test compound with a high or low level of phosphorylation by comparison with a control that has not been
15 contacted with the test compound.

6. A screening method according to claim 5, wherein a compound having a low level of phosphorylation is selected in step (b) of claim 5.

7. An inhibitor of cell growth comprising a compound
20 selected according to the screening method of claim 6 as its active ingredient.

8. A kit for measuring the kinase activity of a Cdc7-ASK complex comprising:

(a) a substrate protein comprising a continuous amino acid
25 sequence that comprises a serine residue at position 17 of the amino acid sequence of SEQ ID NO: 1, and that which is selected from the amino acid sequence of SEQ ID NO: 1; and

(b) an antibody that identifies the level of phosphorylation of the serine residue of the substrate protein at the position
30 corresponding to position 17 of the amino acid sequence of SEQ ID NO: 1.

9. A kit for evaluating the effect of a test compound on the kinase activity of a Cdc7-ASK complex, comprising:

(a) a Cdc7-ASK complex active substance; and,

35 (b) a substrate protein comprising a continuous amino acid sequence that comprises the serine residue at position 17 of the

amino acid sequence of SEQ ID NO: 1, and is selected from this amino acid sequence.

10. A process for producing a Cdc7-ASK complex active substance comprising the following steps:

5 (a) introducing a DNA encoding human Cdc7 protein and a DNA encoding a protein comprising the amino acid sequence described in SEQ ID NO: 10 or a protein functionally equivalent to the protein, into prokaryotic cells in a state that allows monocistronic expression;

10 (b) expressing the two DNAs; and
(c) recovering the expressed protein.

11. An antibody that identifies the level of phosphorylation of the serine residue at position 17 of a protein comprising the amino acid sequence of SEQ ID NO: 1.

15 12. A protein according to any of the following (a) to (d):

(a) a protein comprising the amino acid sequence of SEQ ID NO: 1;

20 (b) a protein comprising a continuous amino acid sequence that is selected from the amino acid sequence described in SEQ ID NO: 3, and comprises the serine of position 17;

(c) a protein comprising an amino acid sequence in which one or more amino acids in the amino acid sequence of SEQ ID NO: 1 are substituted, deleted, added and/or inserted, wherein the protein

25 is phosphorylated by human Cdc7-ASK complex; and

(d) a protein comprising an amino acid sequence comprising 90% or more homology with the amino acid sequence of SEQ ID NO: 3, wherein the protein is phosphorylated by human Cdc7-ASK complex.

30 13. A protein comprising a continuous amino acid that comprises the amino acid sequence of SEQ ID NO: 10 and that which is selected from the amino acid sequence of SEQ ID NO: 9.

14. A polypeptide according to claim 13 that comprises the amino acid sequence of SEQ ID NO: 10.